



## Mortality related to air pollution with the Moscow heat wave and wildfire of 2010

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### Abstract:

**Background:** Prolonged high temperatures and air pollution from wildfires often occur together, and the two may interact in their effects on mortality. However, there are few data on such possible interactions.

**Methods:** We analyzed day-to-day variations in the number of deaths in Moscow, Russia, in relation to air pollution levels and temperature during the disastrous heat wave and wildfire of 2010. Corresponding data for the period 2006-2009 were used for comparison. Daily average levels of PM10 and ozone were obtained from several continuous measurement stations. The daily number of nonaccidental deaths from specific causes was extracted from official records. Analyses of interactions considered the main effect of temperature as well as the added effect of prolonged high temperatures and the interaction with PM10.

**Results:** The major heat wave lasted for 44 days, with 24-hour average temperatures ranging from 24°C to 31°C and PM10 levels exceeding 300 µg/m on several days. There were close to 11,000 excess deaths from nonaccidental causes during this period, mainly among those older than 65 years. Increased risks also occurred in younger age groups. The most pronounced effects were for deaths from cardiovascular, respiratory, genitourinary, and nervous system diseases. Continuously increasing risks following prolonged high temperatures were apparent during the first 2 weeks of the heat wave. Interactions between high temperatures and air pollution from wildfires in excess of an additive effect contributed to more than 2000 deaths. **Conclusion:** Interactions between high temperatures and wildfire air pollution should be considered in risk assessments regarding health consequences of climate change.

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### Resource Description

#### Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Extreme Weather Event, Meteorological Factors, Temperature

**Air Pollution:** Interaction with Temperature, Ozone, Particulate Matter

**Extreme Weather Event:** Wildfires

**Temperature:** Extreme Heat

#### Geographic Feature:

# Climate Change and Human Health Literature Portal

resource focuses on specific type of geography

Urban

## **Geographic Location:**

resource focuses on specific location

Non-United States

**Non-United States:** Europe

**European Region/Country:** European Country

**Other European Country :** Russia

## **Health Impact:**

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Injury, Mental Health/Stress, Morbidity/Mortality, Respiratory Effect, Urologic Effect, Other Health Impact

**Cardiovascular Effect:** Heart Attack, Stroke, Other Cardiovascular Effect

**Cardiovascular Disease (other):** cardiovascular disease mortality

**Mental Health Effect/Stress:** Other Mental Disorder

**Respiratory Effect:** Other Respiratory Effect

**Respiratory Condition (other) :** respiratory disease mortality

**Other Health Impact:** digestive disease mortality

**Population of Concern:** A focus of content

## **Resource Type:**

format or standard characteristic of resource

Research Article

## **Timescale:**

time period studied

Time Scale Unspecified